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# NOTICE OF ALLOWANCE AND FEE(S) DUE

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06/02/2008

Kunzler & McKenzie 8 EAST BROADWAY SUITE 600 SALT LAKE CITY, UT 84111

EXAMINER				
HO, BINH VAN				
ART UNIT	PAPER NUMBER			
ART UNIT	PAPER NUMBER			

2163 DATE MAILED: 06/02/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,609	03/01/2004	Anthony Steve Pearson	SJO920030089US1	9579

TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD FOR MANAGING MULTIPLE COPY VERSIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	09/02/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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45216 Kunzler & Mc 8 EAST BROAI SUITE 600	Kenzie DWAY	V2008		State	eby certify that thi	s Fee(	of Mailing or Transt b) Transmittal is being ficient postage for first ISSUE FEE address 1) 273-2885, on the da	deposited	il in an envelone
SALT LAKE C	ITY, UT 84111								(Depositor's name)
									(Signature)
									(Date)
APPLICATION NO.	FILING DATE		FIRST NAMED INVENTOR ATTORNEY DOCKET NO.			CONFIR	MATION NO.		
10/790,609 TITLE OF INVENTION	03/01/2004 N: APPARATUS, SYSTE	EM, AND METHOD FOR	Anthony Steve Pear: R MANAGING MULT		E COPY VERSION		0920030089US1		9579
APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE D	UE	PREV. PAID ISSUE	E FEE	TOTAL FEE(S) DUE	D	OATE DUE
nonprovisional	NO	\$1440	\$300		\$0		\$1740	0	9/02/2008
EXAM	MINER	ART UNIT	CLASS-SUBCLASS	S					
HO, BI	NH VAN	2163	707-203000		l				
"Fee Address" inc PTO/SB/47; Rev 03-( Number is required.  3. ASSIGNEE NAME A PLEASE NOTE: Un	AND RESIDENCE DATA less an assignee is ident th in 37 CFR 3.11. Comp	" Indication form	data will appear on the	rnativesingle or a strong libe or type he page an a	rely, e firm (having as a gent) and the name rneys or agents. If a printed.  e) ttent. If an assigner assignment.	memb es of up no nam	er a 2 o to e is 3 entified below, the do	cument h	as been filed for
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	itus (from status indicated as SMALL ENTITY state		☐ b. Applicant is no	o long	ger claiming SMAL	L ENT	TITY status. See 37 CF	R 1.27(g)	(2).
NOTE: The Issue Fee ar interest as shown by the	nd Publication Fee (if req records of the United Sta	uired) will not be accepte ttes Patent and Trademark	d from anyone other the Office.	nan tl	ne applicant; a regi	stered a	ttorney or agent; or the	assignee	or other party in
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an application Confider	ntiality is governed by 35 dapplication form to the ions for reducing this but Virginia 22313-1450. DC	CFR 1.311. The informatic U.S.C. 122 and 37 CFR USPTO. Time will vary rden, should be sent to th O NOT SEND FEES OR	1.14 This collection i	e oct	imated to take 12 r	ninutec	to complete including	x anthorine	a preparing and

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45216 7	590 06/02/2008		EXAM	INER	
Kunzler & McK	enzie		HO, BIN	IH VAN	
8 EAST BROADV	WAY		ART UNIT	PAPER NUMBER	
SUITE 600 SALT LAKE CIT	Y, UT 84111		2163 DATE MAILED: 06/02/200	8	

# **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 506 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 506 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 (571)-272-4200.

	Application No.	Applicant(s)
	10/790.609	PEARSON ET AL.
Notice of Allowability	Examiner	Art Unit
	D	
	BINH V. HO	2163
The MAILING DATE of this communication appear All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT R of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED in this a or other appropriate communication (IGHTS. This application is subject	application. If not included on will be mailed in due course. <b>THIS</b>
1. This communication is responsive to <u>02/19/2008</u> .		
2. The allowed claim(s) is/are <u>1,8-20 and 27-32</u> .		
<ol> <li>Acknowledgment is made of a claim for foreign priority u</li> <li>a) ☐ All b) ☐ Some* c) ☐ None of the:</li> </ol>	nder 35 U.S.C. § 119(a)-(d) or (f).	
<ol> <li>Certified copies of the priority documents have</li> </ol>	e been received.	
2.  Certified copies of the priority documents have	e been received in Application No.	·
<ol><li>Copies of the certified copies of the priority do</li></ol>	cuments have been received in thi	s national stage application from the
International Bureau (PCT Rule 17.2(a)).		
* Certified copies not received:		
Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONN THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		ly complying with the requirements
4. A SUBSTITUTE OATH OR DECLARATION must be subm INFORMAL PATENT APPLICATION (PTO-152) which giv		
5. CORRECTED DRAWINGS ( as "replacement sheets") mus	st be submitted.	
(a) ☐ including changes required by the Notice of Draftspers		O-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date	•	,
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Paper No./Mail Date		
Identifying indicia such as the application number (see 37 CFR 1 each sheet. Replacement sheet(s) should be labeled as such in the sheet.		
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Attachment(s) 1. ☑ Notice of References Cited (PTO-892)	5. ☐ Notice of Informal	Patent Application
<ol> <li>Induce of References Cited (FTO-692)</li> <li>Induce of References Cited (FTO-</li></ol>	_	
2. In Notice of Dransperson's Faterit Drawing Review (PTO-946)	6.	Date .
3. Information Disclosure Statements (PTO/SB/08),	7. 🔲 Examiner's Amen	dment/Comment
Paper No./Mail Date  4.	8. 🛛 Examiner's Stater	ment of Reasons for Allowance
or biological material	9.	

Art Unit: 2163

### **DETAILED ACTION**

### **Examiner's Amendment**

1. An examiner's amendment to the record appears below. Should the changes and /or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.3.12. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. The following claim has been amended upon agreement by applicant during a telephone conversation with Mr. Scott Thorpe on 05/09/2008.

Amendments to claims 1, 8, 11, 17, 20, and 30-32; claims 5-7 and 24-26 are cancelled:

Claim 1 (Currently Amended):

An apparatus for managing multiple copy versions of a source volume, the apparatus comprising: a replication record management module <u>comprising executable</u> <u>code stored on a semiconductor device, executed by a processor, and configured to maintain a current replication record descriptive of a current copy version of a source volume and comprising a time, a copy version, and at least one copy pair, and maintain a previous replication record descriptive of a previous copy version;</u>

a pre-pairing module comprising executable code stored on the semiconductor device, executed by the processor, and configured to create a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair;

Art Unit: 2163

a pre-pairing record management module configured to maintain [[a]]the future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pairand a previous pre-pairing

record descriptive of a previous copy version;

a copy record module <u>comprising executable code stored on the semiconductor</u>

<u>device, executed by the processor, and configured to create a copy record from a pre-</u>

copy record, the pre-copy record comprising the future pre-pairing record if the future

pre-pairing record exists else comprising the current replication record;

a replication module <u>comprising executable code stored on the semiconductor</u>

<u>device, executed by the processor, and configured to replicate the source volume on a target volume, create a new copy version of the source volume according to the copy record, and establish a new replication record descriptive of the new copy version of the source volume; and</u>

the replication record management module is further configured to compare the new replication record to the current replication record and to break a copy pair for a removed source volume present in the current replication record, but not present in the new replication record.

Claim 5 (Cancelled)

Claim 6 (Cancelled)

Claim 7 (Cancelled)

Claim 8 (Currently Amended)

The apparatus of claim 1, further comprising a target selection module comprising executable code stored on the semiconductor device, executed by the processor, and configured to locate a target volume available for use to create a copy version of the source volume.

Claim 11 (Currently Amended)

An apparatus for managing multiple copy versions of a source volume, the apparatus comprising:

a replication record management module <u>comprising executable code stored on</u>

<u>a semiconductor device</u>, <u>executed by a processor</u>, <u>and configured to maintain a plurality</u>

of replication records, each replication record descriptive of a copy version of a source

volume, the replication records comprising a current replication record and a previous

replication record descriptive of a previous copy version, the replication records

comprising a time, a copy version, and at least one copy pair,;

a pre-pairing module comprising executable code stored on the semiconductor device, executed by the processor, and configured to create a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair;

a pre-pairing record management module <u>comprising executable code stored on</u> the semiconductor device, executed by the processor, and configured to maintain a

plurality of pre-pairing records, each pre-pairing record descriptive of a copy version of the source volume, the pre-pairing records comprising the future pre-pairing record and a previous pre-pairing record descriptive of a previous copy version;

a copy record module <u>comprising executable code stored on the semiconductor</u> <u>device, executed by the processor, and configured to create a copy record from a precopy record, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record;</u>

a replication module <u>comprising executable code stored on the semiconductor</u>

<u>device, executed by the processor, and configured to replicate the source volume on a target volume, create a new copy version of the source volume according to the copy record, and establish a new replication record descriptive of the new copy version of the source volume;</u>

the replication record management module is further configured to compare the new replication record to the current replication record and to break a copy pair for a removed source volume present in the current replication record, but not present in the new replication record; and

a record management module <u>comprising executable code stored on the</u>

<u>semiconductor device</u>, <u>executed by the processor</u>, <u>and configured to dynamically</u>

manage the plurality of replication records and pre-pairing records in response to a change in the data copy environment.

Claim 17 (Currently Amended)

A system for managing multiple copy versions of a source volume, the system comprising:

a storage subsystem configured to store backup data;

a backup manager <u>comprising executable code stored on a semiconductor</u>
<u>device, executed by a processor, and configured to direct the storage subsystem to</u>
create a plurality of copy versions from a plurality of source volumes and to store
backup information descriptive of each of the plurality of copy versions;

a backup management apparatus configured to manage the plurality of copy versions and the backup information descriptive of each of the plurality of copy versions;

a replication record management module <u>comprising executable code stored on</u>

<u>the semiconductor device</u>, <u>executed by the processor</u>, <u>and configured to maintain a</u>

current replication record descriptive of a current copy version of a source volume, <u>and</u>

<u>maintain a previous replication record descriptive of a previous copy version</u>;

a pre-pairing module comprising executable code stored on the semiconductor device, executed by the processor, and configured to create a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair;

a pre-pairing record management module <u>comprising executable code stored on</u>

the <u>semiconductor device</u>, <u>executed by the processor</u>, <u>and configured to maintain</u>

[[a]]the future pre-pairing record <del>descriptive of a future copy version of the source volume</del> and a previous pre-pairing record <del>descriptive of a previous copy version</del>; and

a copy record module <u>comprising executable code stored on the semiconductor device</u>, <u>executed by the processor</u>, <u>and configured to create a copy record from a pre-copy record</u>, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record;

a replication module <u>comprising executable code stored on the semiconductor</u>

<u>device, executed by the processor, and configured to replicate the source volume on a target volume, create a new copy version of the source volume according to the copy record, and establish a new replication record descriptive of the new copy version of the source volume; and</u>

the replication record management module is further configured to compare the new replication record to the current replication record and to break a copy pair for a removed source volume present in the current replication record, but not present in the new replication record.

Claim 20 (Currently Amended)

A computer readable storage medium comprising computer readable code configured to carry out a method for managing multiple copy versions of a source volume, the method comprising:

maintaining a current replication record descriptive of a current copy version of a source volume;

maintaining a previous replication record descriptive of a previous copy version;

Art Unit: 2163

creating a future pre-pairing record descriptive of a future copy version of the source

volume and comprising a time, a copy version, and at least one copy pair;

maintaining [[a]]the future pre-pairing record descriptive of a future copy version

of the source volume;

maintaining a previous pre-pairing record descriptive of a previous copy version;

creating a copy record from a pre-copy record, the pre-copy record comprising

the future pre-pairing record if the future pre-pairing record exists else comprising the

current replication record;

replicating the source volume on a target volume, creating a new copy version of

the source volume according to the copy record;

establishing a new replication record descriptive of the new copy version of the

source volume;

comparing the new replication record to the current replication record; and

breaking a copy pair for a removed source volume present in the current

replication record, but not present in the new replication record.

Claim 24 (Cancelled)

Claim 25 (Cancelled)

Claim 26 (Cancelled)

Claim 30 (Currently Amended)

A method for managing multiple copy versions of a source volume, the method comprising:

maintaining a current replication record descriptive of a current copy version of a source volume;

maintaining a previous replication record descriptive of a previous copy version; creating a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair;

maintaining [[a]]the future pre-pairing record descriptive of a future copy version of the source volume;

maintaining a previous pre-pairing record descriptive of a previous copy version; creating a copy record from a pre-copy record, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record;

replicating the source volume on a target volume, creating a new copy version of the source volume according to the copy record;

establishing a new replication record descriptive of the new copy version of the source volume;

comparing the new replication record to the current replication record; and breaking a copy pair for a removed source volume present in the current replication record, but not present in the new replication record.

Art Unit: 2163

Claim 31 (Currently Amended)

A method for managing multiple copy versions of a source volume, the method comprising:

maintaining a current replication record descriptive of a current copy version of a source volume;

maintaining a previous replication record descriptive of a previous copy version;

creating a future pre-pairing record descriptive of a future copy version of the

source volume and comprising a time, a copy version, and at least one copy pair;

maintaining [[a]]the future pre-pairing record descriptive of a future copy version of the source volume;

maintaining a previous pre-pairing record descriptive of a previous copy version; creating a copy record from a pre-copy record, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record;

replicating the source volume on a target volume and create a new copy version of the source volume according to the copy record;

establishing a new replication record descriptive of the new copy version of the source volume;

maintaining a replication record descriptive of a previous copy version;

verifying the pre-copy record, accounting for a change in one of a source pool and a target pool;

replicating the source volume on a target volume, creating a new copy version of the source volume according to the copy record;

establishing a new replication record descriptive of the new copy version of the source volume;

comparing the new replication record to the current replication record; and breaking a copy pair for a removed source volume present in the current replication record, but not present in the new replication record.

Claim 32 (Currently Amended)

An apparatus for managing multiple copy versions of a source volume, the apparatus comprising:

means for maintaining a current replication record descriptive of a current copy version of a source volume and maintaining a previous replication record descriptive of a previous copy version, the replication record maintaining means comprising executable code stored on a semiconductor device and executed by a processor;

means for creating a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair, the pre-pairing record creating means comprising executable code stored on the semiconductor device and executed by the processor;

means for maintaining [[a]]the future pre-pairing record and a previous prepairing record descriptive of a previous copy version descriptive of a future copy version of the source volume, the pre-pairing record maintaining means comprising executable code stored on the semiconductor device and executed by the processor;

means for creating a copy record from a pre-copy record, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record, the copy record creating means comprising executable code stored on the semiconductor device and executed by the processor;

means for replicating the source volume on a target volume, creating a new copy version of the source volume according to the copy record, the replicating means comprising executable code stored on the semiconductor device and executed by the processor;

means for establishing a new replication record descriptive of the new copy version of the source volume, the establishing means comprising executable code stored on the semiconductor device and executed by the processor;

means for comparing the new replication record to the current replication record, the comparing means comprising executable code stored on the semiconductor device and executed by the processor; and

means for breaking a copy pair for a removed source volume present in the current replication record, but not present in the new replication record, the breaking means comprising executable code stored on the semiconductor device and executed by the processor.

The Examiner's amendment has been made in order to place the application in a condition for allowance.

Art Unit: 2163

### **Reasons for Allowance**

3. The following is an examiner's statement of reason for allowance:

Claims 1, 11, 17, 20, and 30-32 are considered allowable since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Ding (U.S. 6,978,282) or Leung (U.S. 5,937,343), taken individually or in combination, do not teach an apparatus for managing multiple copy versions of a source volume, the apparatus comprising a replication record management module comprising executable code stored on a semiconductor device, executed by a processor, and configured to maintain a current replication record descriptive of a current copy version of a source volume and comprising a time, a copy version, and at least one copy pair, and maintain a previous replication record descriptive of a previous copy version; a pre-pairing module configured to create a future pre-pairing record descriptive of a future copy version of the source volume and comprising a time, a copy version, and at least one copy pair; a copy record module configured to create a copy record from a pre-copy record, the pre-copy record comprising the future pre-pairing record if the future pre-pairing record exists else comprising the current replication record; a pre-pairing record management module configured to maintain the future pre-pairing record and a previous pre-pairing record descriptive of a previous copy version with a combination of all recitations as defined in claims 1, 11, 17, 20, and 30-32.

Therefore, claims 1, 8-20, and 27-32 are presently allowed.

Art Unit: 2163

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Inquiry

5. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Binh V. Ho whose telephone number is 571 272 8583.

The examiner can normally be reached on M-F from 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Don K. Wong can be reached on 571 272 1834. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

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Business Center (EBC) at 866-217-9197 (toll-free).

Binh V Ho Examiner

Art Unit 2163

/don wong/

Art Unit: 2163

Supervisory Patent Examiner, Art Unit 2163